

REMARKS

Claim Objections

The Examiner pointed out the grammatically incorrect use of a coordinating conjunction “and” and the Applicant amended claims as the Examiner suggested.

Claim Rejections under 35 USC § 103

Claims 2, 4, 7-12 were rejected under 35 USC § 103(a) as being unpatentable over Aubay (US 6,905,814) in view of Batarsch (US 6,630,172). In response, the Applicant amended claims as described on the attached claim amendment and respectfully traverses the rejections for the following reasons.

Claim 9

The Applicant submits that the amended claim 9 is now patentable for the following reasons.

First, the applicant added the limitation that “the aqueous solution is diluted with water such that a titanium dioxide concentration is in the range of *3 to 100 ppm* for greater effect on crop yield, when applied to the foliage of crops.” (emphasis added). The concentration range of *3 to 100 ppm* is not disclosed in Aubay. On the contrary, in Aubay, the concentration of titanium dioxide ranges from 0.01% (or 100 ppm) to 15% (col 2, lines 12-15).

Second, the Examiner argues that the combination would have been obvious to one of ordinary skill in the art at the time of the present invention, but the combination of titanium dioxide nanoparticles and silver nanoparticles as claimed is not taught or suggested by the references alone or in combination. Nor would one of ordinary skill in the art combine them as there is no suggestion or motivation in either to combine the two.

Titanium dioxide nanoparticles are known to have a bactericidal effect, but the bactericidal effect is deteriorated when the sunlight is blocked or during the nighttime. [Paragraph 0062]. Silver nanoparticles are known to have high bactericidal activity, but they are expensive and hard to apply to agricultural crops alone. [Paragraphs 0064]. In the present invention, the applicant figured out a way to overcome these two downsides of

titanium dioxide nanoparticles and silver nanoparticles by combining two of them in a certain weight ratio. The combination, having only minimum quantity of silver particles, showed excellent bactericidal activity. The applicant suggested that silver nanoparticles of 1.0 to 10% by weight, relative to the titanium dioxide solids, will show economical efficiency in bactericidal activity.

Third, the Applicant amended claim 9 by adding the limitation that the titanium dioxide particles have the crystal structure generally of anatase. There are three types of titanium dioxide structure: anatase-type, rutile-type, and brookite-type. In [paragraph 0054], the Applicant explained why anatase crystal type is preferable for the purpose of the present invention.

Therefore, the rejection of claim 9 under 35 USC § 103(a) should be withdrawn.

Claims 10, 13 and 14

Claims 10, 13 and 14 are also patentable as being dependant on patentable claim 9.

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
CONCLUSION

The applicant now believes that the rejections are obviated by this amendment, and the application is now in condition for allowance: therefore, reexamination, reconsideration and allowance of the claims are respectfully requested. If there are any additional comments or requirements from the examination, the applicant asks for a non-final office action.

Very truly yours,

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